SB 761
U7S7
#82-11

United States
Department of
Agriculture
**Forest
Service**
Southwestern
Region

Forest Pest Management Report

R-3 82-11

BIOLOGICAL EVALUATION
Damage to Trees II

Chaco Canyon National Cultural Park
Bloomfield, New Mexico

July 1982

LIBRARY
AUG 30 1982
ROCKY MOUNTAIN STATION

3430

R-3 82-11

BIOLOGICAL EVALUATION
Damage to Trees II

Chaco Canyon National Cultural Park
Bloomfield, New Mexico

July 1982

Forest Pest Management
State and Private Forestry
Southwestern Region, USDA Forest Service
517 Gold Avenue, SW
Albuquerque, New Mexico 87102

PREPARED BY:

Robert E. Wood

ROBERT E. WOOD, Plant Pathologist
Forest Pest Management

APPROVED BY:

Douglas L. Parker

DOUGLAS L. PARKER
Director of Forest Pest Management

INTRODUCTION

Cottonwoods, willows, and tamarisks were planted in the arroyo in Chaco Canyon National Monument (now Chaco Canyon National Cultural Park), New Mexico, from around 1940 to about 1960. The number of species planted cannot be determined; the survivors are mainly Rio Grande cottonwood (*Populus wislizenii*) and tamarisk (*Tamarix pentandra*), with a few willows (*Salix* sp.) and narrowleaf cottonwoods (*Populus angustifolia*). Many of the cottonwoods were cut down in the 1950's to provide construction materials for soil anchorages to facilitate the planting of willows. Sprouts from the resulting stumps have grown into dense clumps with 4- to 5-foot spacing between stems, scattered throughout the arroyo or occurring as "stringers" oriented parallel to the arroyo wall, but 20 to 50 feet from it.

THE PROBLEM

A sudden drop in temperature to 17° F, which occurred on May 24 and 25, 1980, caused considerable damage to young leaves, flowers and shoots of cottonwoods and willows, and to leaves and shoots of tamarisks. The extent and severity of the damage were evaluated in June 1980 (biological evaluation, Damage to Trees, Chaco Canyon National Monument, June 1980). A subsequent followup was made on October 3, 1980. In the initial evaluation, we predicted that the damage, while widespread, would not be severe or lasting, and that no mortality would occur. The followup evaluation established that damage was much more severe in cottonwoods than predicted, and included extensive twig and branch dieback as well as some tree mortality. In order to determine the final effects of the freeze damage, an inspection was made on July 7, 1982.

METHODS

The inspection was conducted by walking the arroyo from the bridge near the Visitor Center to opposite Casa Chiquita and looking at every tree. We did not take data on extent of dieback or record the number of dead and damaged trees; instead, we observed and discussed them and arrived at general conclusions.

RESULTS

Significant outright mortality has occurred in Rio Grande cottonwood; in addition, several trees have declined to the point that they will probably die. About 10 to 20 percent of the Rio Grande cottonwoods in the wash are dead or dying; a disproportionately large number of these are smaller, presumably young stems. Another 10 to 20 percent of the cottonwoods have been killed back far enough that they are severely stressed. Secondary canker-causing organisms are contributing to the dieback. It is doubtful if these trees could survive another period of stress, such as that caused by drought or freeze. Even if they

survive, the rate at which these trees become decadent will increase. Furthermore, dead branches and boles will serve as infection courts for wood decays which eventually will weaken live stems to the point that breakage will occur.

No mortality attributable to the freeze was seen in willows or in narrowleaf cottonwood. The willows have largely recovered from the effects of the freeze. One narrowleaf cottonwood was severely damaged and may die. Seven narrowleaf cottonwoods located below the Pueblo Bonito bridge on the southwest side of the wash are declining from the effects of silt deposited around their bases. Mushrooms identified as Coprinus micaceus were found at the base of one of the declining trees and it is possible that this fungus is accelerating the decline.

Porcupines have killed some cottonwood shoots and branches. The damage is now light, but is increasing. Since porcupines prefer small trees, trees planted in the future will probably be damaged much more severely.

RECOMMENDATION

The alternatives discussed and recommended in our June 1980 biological evaluation, planting a variety of tree species and thinning dense clumps, remain valid. The outright loss of 10 to 20 percent of the cottonwoods in the wash, and the increasing rate of decadence in the remaining trees, means that the need to plant additional trees is even greater than previously thought.